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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/886,213	06/22/2001	Yuji Matsuyama	210029US3DIV	7008

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EXAMINER	
JOLLEY, KIRSTEN	

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/886,213	MATSUYAMA ET AL.	
	Examiner	Art Unit	
	Kirsten C Jolley	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-4,6-8,25-28 and 33-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2-4,6-8,25-28 and 33-36* is/are allowed.

6)☒ Claim(s) *37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/272,782.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The 35 USC 103(a) claim rejections set forth in the prior Office action over Nakano et al. have been withdrawn in response to Applicant's amendments to the claims requiring removing the substrate from the heating chamber by a moving mechanism having a cooling unit while cooling the substrate by the cooling unit.

Specification

2. The first line of the specification should be amended to indicate the updated status of the parent application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano et al. (US 6,423,651) alone or in view of Haluska (US 5,380,567).

Nakano et al. discloses a method of applying an insulating film forming coating to a semiconductor substrate, followed by heating and curing the coating in an inert gas atmosphere (col. 10, lines 56-58). Specifically, Nakano et al. states "by heating and curing in an inert gas

atmosphere, the insulating film forming solution is polymerized and cured without being mixed with oxygen" and "*at the time of polymerization and curing* of the insulating film forming solution, the insulating film forming solution is not oxidized [emphasis added]" (col. 6, lines 24-41). Nakano et al. does not specifically set forth that the oxygen concentration of a treatment atmosphere is lowered when a temperature of the substrate is lower than the temperature at which the coating solution oxidizes, or that the original oxygen concentration is returned after completion of the heat treatment. However, it would have been well within the skill of one having ordinary skill in the art to have first supplied inert gas into a heat treatment chamber followed by heating in the process of Nakano et al., and then delaying the introduction of atmospheric air into the chamber until after the temperature is lowered (after heat treatment) because Nakano et al. clearly teaches that an inert atmosphere is desired *when the curing and polymerization occurs* (i.e., at the high temperature). One skilled in the art would have recognized that if the inert gas is not introduced until after heating has started, or atmospheric air is introduced into the chamber prior to cooling the substrate, then some undesired oxidation of the coating will occur because there is at least some amount time that has elapsed when both the temperature is high and the atmosphere contains oxygen.

Alternatively, Nakano et al. is applied in view of Haluska. Haluska similarly teaches a desire to perform its heat treatment step in the absence of oxygen, using an inert gas atmosphere, to prevent oxidation of the substrate. Haluska discloses the sequential steps of placing the coated substrate in a convection oven, introducing a continuous flow of inert gas, then raising the temperature in the oven to the desired level and for the desired time (col. 5, lines 48-54). It would have been obvious to one having ordinary skill in the art to have performed the sequence

of steps (i.e., first introducing inert gas followed by heating) taught by Haluska in the inert gas atmosphere heat treatment process of Nakano et al. in order to prevent any amount of undesired oxidation of Nakano et al.'s coating which is taught to occur when curing/polymerization takes place in an oxygen-containing atmosphere.

As to the lengths of time, it would have been obvious for one having ordinary skill in the art to have heat-treated the substrate for a period of time longer than the periods of time that it takes to lower the oxygen concentration and return the oxygen concentration to its original level, since heat treatments typically are conducted over a significant length of time. Further, the length of time of heating is a known cause-effective variable depending upon a number of factors such as the heating temperature, desired results, coating thickness, etc. It is well settled that determination of optimum values of cause effective variables such as these process parameters is within the skill of one practicing in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Allowable Subject Matter

5. Claims 2-4, 6-8, 25-28, and 33-36 are allowed. The prior art does not teach or fairly suggest a method of heat-treating a coated substrate in a heating chamber while controlling/lowering an oxygen concentration of the heat-treatment atmosphere, whereby the coating solution oxidizes at a high temperature, and including the step of removing the substrate from the heating chamber by a moving mechanism having a cooling unit while cooling the substrate by the cooling unit.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P Beck can be reached on 571-272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kirsten C Jolley
Primary Examiner
Art Unit 1762

kcj